INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 1997	**Park:** Shenandoah NP
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No co-investigators

Permit#:
SHEN1997AUMG

Park-assigned Study Id. #:
unknown

Project Title:
Geologic Evolution Of Mesoproterozoic Basement, Blue Ridge Province, Shenandoah National Park, Virgina (N-133B)

Permit Start Date: Jan 01, 1998	**Permit Expiration Date** Jan 01, 1998
Study Start Date: Jan 01, 1996	**Study End Date** Jan 01, 2000

Study Status:
Completed

Activity Type:
Research

Subject/Discipline:
Geology / General

Objectives:
The primary objective of this study is the determination of detailed geologic and geochronologic relationships characterizing Mesoproterozoic metamorphic basement units exposed in that portion of the Blue Ridge province located in Shenandoah National Park, Virginia. The project involves detailed field mapping and an integrated program of petrographic, geochemical and isotopic analyses designed to elucidate petrologic and temporal aspects of the Grenville orogeny.

Findings and Status:
Results from the past year of research include (1) continued field mapping at several locations, (2) petrographic analysis of thin sections samples, (3) major-element geochemical analyses of selected samples and (4) U-Pb isotopic analyses of zircons from one of the mapped lithologic units. Field mapping (both within and outside the National Park) has demonstrated the occurrence of amphibole-bearing charnockite originally igneous in origin. Isotopic results indicate that the pluton was emplaced at 1.15 Ga (billion years ago). The amphibole charnockite is intruded by typically coarse-grained leucocratic charnockite throughout the region. Much of this latter unit probably is correlatable to the old Rag Granite which therefore must be younger. These new data indicate that Grenville-age orogenesis (mountain building) was accompanied by emplacement of abundant amphibole charnockite (probably intruded older garnet-bearing charnockites) which was in turn followed by intrusion of post-orogenic leucocratic charnockites. Such relations are the opposite to present understanding of the geology of the Shenandoah Park area (see signpost overlooking Old Rag Mountain on Skyline Drive). Studies planned for 1998 include (1) continued field mapping and petrographic analysis, (2) major- and trace-element geochemical analyses of another subset of bulk rock samples, (3) mineral chemical studies designed to provide estimates of the temperature and/or pressure conditions of rock formation and (4) U-Pb isotopic analyses of zircons from the Old Rag leucocratic charnockite.

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?
No

Funding provided this reporting year by NPS:	**Funding provided this reporting year by other sources:**

0	0
Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college	
Full name of college or university:	**Annual funding provided by NPS to university or college this reporting year:**
n/a	0